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A COMPARATIVE ANALYSIS OF MRAS BASED AND EXTENDED KALMAN FILTER BASED SENSORLESS VECTOR CONTROL OF INDUCTION MOTOR DRIVES

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Abstract

In recent years, sensorless control scheme for AC drives has been one of the most popular research topics in the area. For direct control of AC motor s, information about its rotational speed or rotational position is crucial and in general shaft mounted tacho-generators and resolvers are used to measure them. The elimination of those transducers has long been an attractive prospect, since the shaft transducers and associated signal wiring are a significant source of failure, additional cost and additional weight. Numerous approaches have been proposed to estimate the rotor velocity and/or position from the machine terminal properties, such as the stator voltage or current. The operation of speed controlled AC drives without mechanical speed sensor or position sensors requires the estimation of internal state variable of the machine. The objective of this paper is to present implementation of a sensorless vector control for a three phase induction motor using Model Referencing Adaptive System and Extended Kalman Filter; compare the results of both the methods.

Keyword : Vector Control, Sensorless Control, Model Referencing Adaptive System, Extended Kalman Filter, State Vector, Indirect stator field orientation, Induction motor drives, Rotor speed estimation